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Dear Professor Lederberg,

Thank you for your letter of October 1st. I did not answer it earlier, because we wanted to know more about the stability of the immunes coming out by segregation of Gal⁻ from heterogenotic Gal⁺ immunes. In fact, the strain that W. Arber found, and which is a stable Gal⁻ "immune", seems to be exceptional; he studied some others, which continued to segregate as yours. In general the situation is complicated by the occurence of many exceptions; for instance, Arber isolated a heterogenotic lysogenic which segregates Gal⁺ defectives and Gal⁻ defectives; these defectives are of the classical type, e.a. producing small amounts of phage.

Therefore our observations are no longer contradictory with yours. We only cannot yet agree with your assumption that immunity is the consequence of "doubling" of the phage locus Lp^s. This mainly by reason of two observations;

1) Our studied "immunes" are induced to lysis (UV-dose to give about 1% survivors on exponentially growing cells resuspended in Bu.).

2) Our induced "immunes" transmit genetic caracters of the phage initially present in the heterogenotic lysogenics. (on recombination)

Because of these two supplementary properties, we call our strains defectives and not immunes.

The recombination experiment seems to me to be beyond any doubt: Gal⁺ defectives were used and compared with the sensitives derived by segregation from them. After UV irradiation, both strains were superinfected with marked λ. A high amount of recombinants is found in the bursts coming from the defectives, while no recombinants are produced by the sensitives.

W. Arber is establishing a representative set of defectives on which he will extend his experiments. I think that he will find also strains which are only immunes, without defective prophage.

We will be glad to tell you about it as soon as we have reliable results. Advance in this field is not very fast, owing to the necessity of numerous tests. (Despite the use of your wonderful "replica plating".)

Jean Weigle has written to me that he sent you a M.S. on the work he did here on the multiplication of Gal⁺ locus of multiplying h.fr.-transducing phage in infected sensitive bacteria. It will be interesting to imagine the form under which Gal⁺ (and Lp^s) multiply together with λ and to know if they remain linked in the vegetative phase!

Very sincerely yours

M Meselson